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(54) **SYSTEM AND METHOD FOR IMPLEMENTING AN ADAPTIVE REPLACEMENT CACHE POLICY**

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(51) **Int. Cl.**
G06F 12/00 (2006.01)

(52) **U.S. Cl.** **711/129**; 711/133; 711/170

(58) **Field of Classification Search** 711/129, 711/133, 170

See application file for complete search history.

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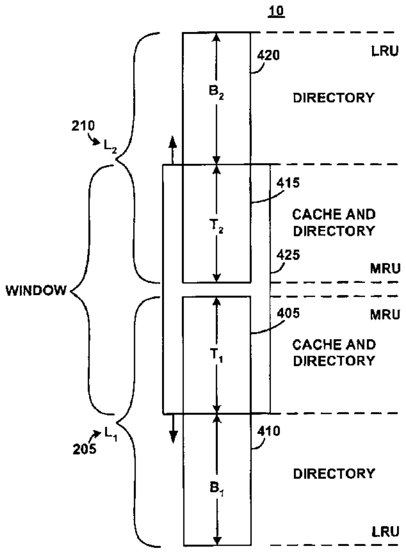
(57) **ABSTRACT**

An adaptive replacement cache policy dynamically maintains two lists of pages, a recency list and a frequency list, in addition to a cache directory. The policy keeps these two lists to roughly the same size, the cache size c. Together, the two lists remember twice the number of pages that would fit in the cache. At any time, the policy selects a variable number of the most recent pages to exclude from the two lists. The policy adaptively decides in response to an evolving workload how many top pages from each list to maintain in the cache at any given time. It achieves such online, on-the-fly adaptation by using a learning rule that allows the policy to track a workload quickly and effectively. This allows the policy to balance between recency and frequency in an online and self-tuning fashion, in response to evolving and possibly changing access patterns. The policy is also scan-resistant. It allows one-time-only sequential read requests to pass through the cache without flushing pages that have temporal locality. The policy is extremely simple to implement and requires only constant-time overhead per request. The policy has negligible space overhead.

42 Claims, 11 Drawing Sheets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